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**west virginia department of environmental protection**

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Earl Ray Tomblin, Governor  
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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Registration No.: R13-3318  
Plant ID No.: 011-00218  
Applicant: Marshall University (Marshall)  
Facility Name: Huntington Campus  
Location: Huntington, Cabell County  
NAICS Code: 611310  
Application Type: Construction  
Received Date: May 6, 2016  
Engineer Assigned: William T. Rothwell II, P.E.  
Fee Amount: \$2,000.00  
Date Received: May 9, 2016  
Complete Date: June 5, 2016  
Applicant Ad Date: May 17, 2016  
Newspaper: *The Herald-Dispatch*  
UTM's: Easting: 375.11 km    Northing: 4,253.72 km    Zone: 17  
Description: Marshall has applied for an after-the-fact permit for five (5) emergency generators that were installed for the purpose of providing back-up electrical power for critical operating functions of on-campus structures. The operational dates for the generators vary and date back to 1982. The emergency generators will be operated no more than 500 hours per year and the facility will limit testing and maintenance use to 100 hours per engine per calendar year.

BACKGROUND DISCUSSION

A total of five emergency generators have been installed and operated on the Marshall campus since 1982. Diesel fueled and natural gas emergency generators of various size were added over the course of the facilities development to provide backup emergency power for critical facility operations. The last emergency generator was installed in 2015. The following Table outlines the facility/generator configuration:

Table 1: Generator Locations

Generator #	Source Location	Size (kW)	Make/Model	Year
EG-1	Joan C. Edwards Stadium	300	Kohler 300 ROZD71	1991
EG-2	Weisburg Family Applied Engineering Complex	787	Caterpillar DCPXL15.2NZS	2013
EG-3	Robert C. Byrd Biotechnology Building	1818	Caterpillar 3512	2004
EG-4	Science Building	140	Kohler 100RZ82	1982
EG-5	Harless Dining Hall	500	Cummins GGKD-5588961	2003

## REGULATORY DISCUSSION

Four of the engines were manufactured prior to 2006 (Units EG-1, EG-3, EG-4, and EG-5); thus, these engines would normally be governed under the U.S. EPA's National Emission Standards for Hazardous Pollutants ("NESHAP") as per 40CFR63 Subpart ZZZZ. However, Marshall qualifies for Subpart ZZZZ's institutional exemption, therefore, the provisions do not apply to these affected sources. The remaining one engine (Unit EG-2) was manufactured in 2015; thus, this engine operates under EPA's New Source Performance Standard ("NSPS"). Engine EG-2 is Tier II certified and will operate under 40CFR60 Subpart IIII.

The NSPS engine meets the requirements of the NESHAP by operating under the NSPS. Engines operating under the NESHAP cannot use the WV DEP's General Permit for Emergency Engines and therefore, must be registered through an individual Rule 13 Permit.

The facility will limit testing and maintenance use to 100 hours per engine per calendar year; thus, the engines will maintain their emergency status as per the NESHAP and NSPS regulations.

The NESHAP engines will comply with the following maintenance requirements:

- Operate/maintain engine & control device per manufacturer's instructions or owner-developed maintenance plan
- Change oil/filter and inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually
- Emergency engines must have hour meter and record hours of operation
- Keep records of maintenance

Table 3 outlines the proposed equipment and control device information taken from permit application R13-3318:

Table 3: Equipment and Control Device Listing

Emission Unit ID	Emission Unit Description	Detail Make/Model/ Fuel	Year Installed/ Modified	Design Capacity
EG-1	Emergency Generator with integrated sub-base tank	Kohler/ 300 ROZD71 / 2FO	1991	300 kW
EG-2	Emergency Generator with integrated sub-base tank	Caterpillar / DCPXL15.2NZS / 2FO	2013	500 kW
EG-3	Emergency Generator with integrated sub-base tank	Caterpillar / 3512 / 2FO	2004	1250 kW
EG-4	Emergency Generator	Kohler/ 100RZ82 / PQ	1982	100 kW
EG-5	Emergency Generator	Cummins / GGKD- 5588961 / PQ	2003	150 kW

### SITE INSPECTION

This is an application for five (5) emergency generators installed for the purpose of allowing key systems to continue to operate without interruption during times of utility power outages. A site inspection was deemed unnecessary by the writer at this time, however, the facilities will be placed on the emergency generator list of sources from this permitting action.

Directions: From I-64 use Exit 11 (Hal Greer Blvd) then get on Rt 10 North and follow it for approximately 2.6 miles. Turn right onto 5<sup>th</sup> Avenue then left onto John Marshall Drive.

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission estimates for criteria pollutants, hazardous and toxic pollutants were determined using emission factors from AP-42, 5<sup>th</sup> Edition, 1996 and Tier II limits where applicable. Emission estimates were calculated by the applicant and checked for accuracy and completeness by the writer.

Marshall's proposed facility emergency generator installations and operations will result in the following estimated potential to discharge controlled emissions:

Table 4: Emergency Generator Emission Summary - Criteria Pollutants

Source ID No.	Potential Emissions (lbs/hr)					Potential Emissions (tons/yr) (500 hours)				
	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>
EG-1	9.94	4.12	1.17	0.97	1.04	2.48	1.03	0.29	0.24	0.26
EG-2	10.25	4.15	1.94	1.61	0.23	2.56	1.04	0.49	0.40	0.06
EG-3	56.36	12.36	4.50	3.73	4.00	14.09	3.10	1.12	0.93	1.00
EG-4	1.23	16.53	0.17	0.01	0.01	0.31	4.13	0.04	0.01	0.01
EG-5	8.60	0.34	0.28	0.01	0.01	2.14	0.09	0.07	0.01	0.01
TOTAL	86.38	37.5	8.06	8.33	15.29	21.58	9.39	2.01	3.59	11.34

Table 5: Total Facility Criteria Pollutant PTE Summary

Pollutant	Facility Wide PTE (tons/year)
Nitrogen Oxides	21.58
Carbon Monoxide	9.39
Volatile Organic Compounds	2.01
Particulate Matter-10	11.34
Sulfur Dioxide	3.59
Formaldehyde	0.79

## REGULATORY APPLICABILITY

PSD has no applicability to the proposed facility. The facility is subject to the following state and federal rules:

**45CSR13** *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation*

The proposed construction is subject to the requirements of 45CSR13 because there will be a potential to discharge controlled emissions in excess of 6 pph and 10 tpy of a regulated air pollutant. In addition, the proposed construction is ineligible for a General Permit and therefore requires a Rule 13 Permit to Construct. The applicant has submitted the \$2,000 application fee and published a Class I legal advertisement in *The Herald Dispatch* on May 17, 2016.

**45CSR30** *Requirements for Operating Permits*

Certain compression ignition internal combustion engines are subject to 40CFR60, Subpart III. In this case, the one (1) diesel engine (EG-2) is Tier II certified and subject to 40CFR60, Subpart III.

45CFR60      *Subpart III—Standards of Performance for Stationary Compression Ignition  
Internal Combustion Engines*

Marshall is subject to this subpart because one (1) engine (unit EG-2) was manufactured after April 1, 2006. The engine emissions for this unit are EPA Tier II Certified.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Formaldehyde is emitted from combustion of #2 diesel fuel at very low levels:

Formaldehyde, a colorless, pungent-smelling gas, can cause watery eyes, burning sensations in the eyes and throat, nausea, and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million). High concentrations may trigger attacks in people with asthma. There is evidence that some people can develop a sensitivity to formaldehyde. It has also been shown to cause cancer in animals and may cause cancer in humans. Health effects include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; severe allergic reactions. May cause cancer. May also cause other effects listed under "organic gases."

AIR QUALITY IMPACT ANALYSIS

The installation and operation of the five emergency generators at the Huntington campus is not classified as a major source as defined by 45CSR14 (PSD). For this reason no air quality modeling was required.

MONITORING OF OPERATIONS

60 CFR 60 Subpart III sets specific monitoring and record-keeping requirements for limited use/emergency generator engines:

- Documenting the purpose for operating the engine and
- Performing regular, routine maintenance.

RECOMMENDATION TO DIRECTOR

The information contained in the permit application R13-3318 indicates that compliance with all applicable state rules and federal regulations should be achieved when all proposed control methods are in operation. Therefore, the granting of a permit to Marshall University for the installation and operation of five (5) emergency generators at the Huntington Campus, Cabell County, WV, is hereby recommended.



William T. Rothwell II, P.E.  
Engineer

12/27/2016

Date